Upcoming distinguished lecture features Marie Davidian

By Aleksandra Adomas

The 2012-2013 Distinguished Lecture Series will bring statistician Marie Davidian, Ph.D., to NIEHS on May 8. NIEHS Biostatistics Branch Chief Clarice Weinberg, Ph.D., will host the talk, which will explore the role of statistics in personalized medicine.

Davidian coordinates the Faculty Cluster in Personalized Medicine Discovery at NCSU, which brings together statisticians, mathematicians, and engineers to develop new methodologies for decision-making strategies in a clinical setting. (Photo courtesy of Marie Davidian)

Davidian *(http://www.stat.ncsu.edu/people/davidian/)* is a William Neal Reynolds Professor in the Department of Statistics at North Carolina State University (NCSU), as well as director of the Center for Quantitative Sciences in Biomedicine. She also holds an adjunct position in the Department of Biostatistics and Bioinformatics at Duke University. Among her many honors, Davidian recently received the D.D. Mason Award, in recognition of her outstanding teaching, mentoring, and research. She is currently president of the American Statistical Association.

Discussing her upcoming talk, "The Right Treatment for the Right Patient (at the Right Time)," Davidian said the traditional tactic to evaluating treatments and approving them for the marketplace involves comparing how well they work averaged across a large number of patients. In contrast, personalized medicine takes a more targeted approach, and seeks to determine the optimal treatment for an individual patient based on all information available for that patient. This information includes not only demographic, physiological, and other clinical factors, but also genetic and genomic characteristics that could affect how the patient may respond to drugs, surgeries, vaccinations, or behavioral therapies.

In chronic diseases or disorders, such as cancer or substance abuse, Davidian said a series of treatment decisions must be made as the patient's condition evolves. The goal is to determine the most beneficial treatment option, at each stage, for patients with similar characteristics and responses to previous treatments. Statistical modeling and dynamic programming are essential to analyze the high dimensional data available for each patient, identify variables affecting the clinical outcome, and define the rules to make a personalized treatment decision. Davidian believes combining statistics and quantitative approaches with biomedical science will pave the way to personalized medicine.

(Aleksandra Adomas, Ph.D., is a research fellow in the NIEHS Laboratory of Molecular Carcinogenesis.)

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